Title of Proposed Project

Clinical Genomic Analysis of Rare Disease Research Participants

Name of Core Facility

GENYSIS Clinical Genomic Analysis Core

Core Director Name *Official contact for the program*

Tam P. Sneddon

Project Description

This GENYSIS project is aimed at postdoctoral scholars interested in gaining experience prior to applying for the ABMGG Laboratory Genetics and Genomics (LGG) fellowship or Genetic Counseling School, or those considering transitioning to a career as a clinical variant scientist. GENYSIS is currently analyzing both short-read and long-read genome data from research participants with neurodevelopmental disorders as part of Dr Hunter's Genetic Determinants of Neurological and Developmental Disorders (GDNDD) study. The postdoc will receive hands-on training in clinical variant analysis, including both sequence and structural variants, and variant classification using the ACMG/AMP guidelines. The postdoc will work through one or more GDNDD cases for presentation at the weekly GENYSIS molecular sign-out meetings that are attended by UNC clinical geneticists, lab geneticists, and genetic counselors. As part of the GENYSIS workflow, any clinically significant findings will be validated by Sanger sequencing or qPCR in the McLendon Molecular Genetics lab, and a clinical report will be released to the patient's medical record.

Expected Skill Development

During this GENYSIS project, the postdoctoral scholar will gain experience in analysis and classification of germline sequence and structural variants identified in the genomes of participants enrolled in UNC rare disease clinical genomic research studies. This will involve using in-house software and publicly available resources such as OMIM, ClinVar, ClinGen, gnomAD, and PubMed. Depending upon the postdoc's interests and experience the project could be tailored towards ongoing GENYSIS research projects such as

investigating the use of phenotypes in prioritizing variants, looking at non-coding variants, or writing documentation and protocols.

Scheduling Considerations

The postdoctoral scholar would be invited to a weekly virtual molecular sign-out conference at 1-2pm on Tuesdays, where genome cases are presented, and a weekly variant analyst check-in session at 2-3pm on Wednesdays, where analysts can ask questions and practice presenting to a small group.

Estimated Time Commitment

8 hours/week
Time commitment is also negotiable and can be split over the week or consolidated into one day a week. There are also desks available in the ClinGen/GENYSIS suite on the 4th floor of the Medical Biomolecular Research Building for the postdoc to work, although all meetings can be attended via Zoom.

Expected Project Duration

12 weeks
Expected project duration is also negotiable, but it is thought that 12 weeks would provide the maximum benefit

Designated Mentor(s)

Tam Sneddon, Clinical Assistant Professor and GENYSIS core director, will be the primary mentor assigning tasks and training, and meeting weekly with the postdoc.

Eleanor Fensterle, Research Assistant who works 50% as a variant analyst for GENYSIS and 50% as a variant and gene curator for ClinGen, will provide the postdoctoral participant with any additional tools, resources, or training as necessary

How often will the mentor meet with the participating postdoctoral scholar?

Weekly check-ins
As needed / flexible
Meeting frequency is also negotiable.

Required Background or Skills

The postdoc must have at least a basic understanding of human genetics, but we are most interested in supporting a postdoc with plans to utilize their GENYSIS experience in their future career.

Onboarding Plan

Onboarding during the first week will include required online HIPAA and CITI Human Subjects Research training, if not already certified (2-3 hours), and reading of internal protocols and professional society guidelines as background.

Training Plan

Postdocs will need to provide their ONYEN and use VPN to access the in-house software system. All additional training will be provided by internal protocols, meetings and hands-on experience.

Potential Deliverables/Outcomes

Poster presentation
Training or outreach materials
Contribution to manuscript
Skill Development